

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

International Patent Classification 7 :

B60R 25/02, B62H 5/04, E05B 13/10,
F16C 3/00, G05G 5/00

A1

(11) International Publication Number:

WO 00/48870

(43) International Publication Date:

24 August 2000 (24.08.00)

(21) International Application Number: PCT/US00/04540

(22) International Filing Date: 22 February 2000 (22.02.00)

(30) Priority Data:

09/255,586

22 February 1999 (22.02.99)

US

(71) Applicant: SOUTHCO, INC. [US/US]; 210 N. Brinton Lake Road, Concordville, PA 19331 (US).

(72) Inventor: BERG, Gert; 32 Princess Road, Cheltenham, Gloucestershire GL50 2UR (GB).

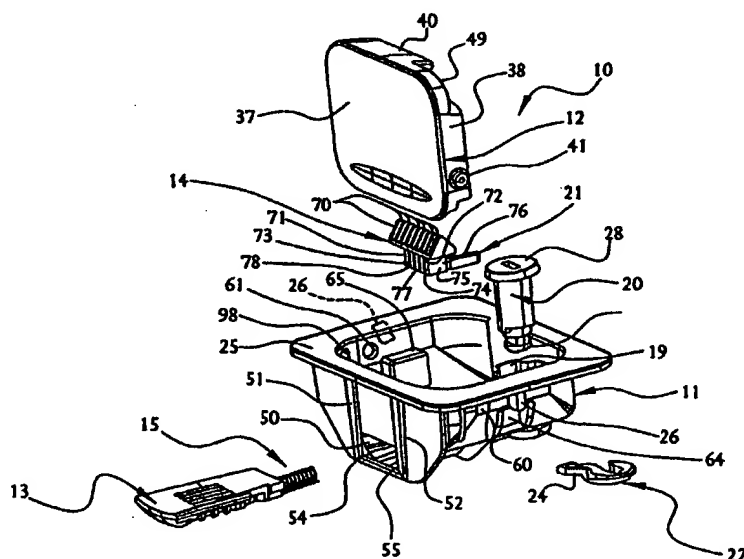
(74) Agents: RAHMAN, Mohammad, S. et al.; Paul & Paul, 2900 Two Thousand Market Street, Philadelphia, PA 19103 (US).

(81) Designated States: AT, AU, BR, CA, CH, CN, CZ, DE, DK, ES, FI, GB, HU, ID, IL, IN, JP, KR, LU, MX, NO, NZ, PL, PT, RU, SE, SG, SI, TR, UA, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published

*With international search report.**Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.*

(54) Title: LOAD FLOOR LATCH



(57) Abstract

A pawl latch (10) for securing a first member to a second member, such as, for example, a closure panel to a frame or enclosure compartment, the latch (10) including a housing (11), a handle (12) pivotally carried on the housing (11), an actuator (14), and a spring biased pawl (13), the handle (12) having a tab (43) which engages with the actuator (14) to retract the pawl (13) from engagement with a keeper member or surface to open the latch (10), the actuator (14) being connected to the pawl (13) through a plurality of slots (81, 82, 83, 84, 85) disposed in the floor of the housing (11). A locking mechanism (20) is also provided for securing the latch (10) from unauthorized opening, the locking mechanism (20) having a locking element (21) which holds the actuator (14) against movement and prevents the retraction of the pawl (13).

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

| | | | | | | | |
|----|--------------------------|----|--|----|--|----|--------------------------|
| AL | Albania | ES | Spain | LS | Lesotho | SI | Slovenia |
| AM | Armenia | FI | Finland | LT | Lithuania | SK | Slovakia |
| AT | Austria | FR | France | LU | Luxembourg | SN | Senegal |
| AU | Australia | GA | Gabon | LV | Latvia | SZ | Swaziland |
| AZ | Azerbaijan | GB | United Kingdom | MC | Monaco | TD | Chad |
| BA | Bosnia and Herzegovina | GE | Georgia | MD | Republic of Moldova | TG | Togo |
| BB | Barbados | GH | Ghana | MG | Madagascar | TJ | Tajikistan |
| BE | Belgium | GN | Guinea | MK | The former Yugoslav Republic of Macedonia | TM | Turkmenistan |
| BF | Burkina Faso | GR | Greece | ML | Mali | TR | Turkey |
| BG | Bulgaria | HU | Hungary | MN | Mongolia | TT | Trinidad and Tobago |
| BJ | Benin | IE | Ireland | MR | Mauritania | UA | Ukraine |
| BR | Brazil | IL | Israel | MW | Malawi | UG | Uganda |
| BY | Belarus | IS | Iceland | MX | Mexico | US | United States of America |
| CA | Canada | IT | Italy | NE | Niger | UZ | Uzbekistan |
| CF | Central African Republic | JP | Japan | NL | Netherlands | VN | Viet Nam |
| CG | Congo | KE | Kenya | NO | Norway | YU | Yugoslavia |
| CH | Switzerland | KG | Kyrgyzstan | NZ | New Zealand | ZW | Zimbabwe |
| CI | Côte d'Ivoire | KP | Democratic People's Republic of Korea | PL | Poland | | |
| CM | Cameroon | KR | Republic of Korea | PT | Portugal | | |
| CN | China | KZ | Kazakhstan | RO | Romania | | |
| CU | Cuba | LC | Saint Lucia | RU | Russian Federation | | |
| CZ | Czech Republic | LI | Liechtenstein | SD | Sudan | | |
| DE | Germany | LK | Sri Lanka | SE | Sweden | | |
| DK | Denmark | LR | Liberia | SG | Singapore | | |
| EE | Estonia | | | | | | |

LOAD FLOOR LATCH

CROSS-REFERENCE TO RELATED APPLICATIONS

This is a continuation-in-part of US application serial no. 09/405,526, filed on
5 September 23, 1999 which is a continuation-in-part of US application serial no.
09/255,586, filed on February 22, 1999, the complete disclosures of which are herein
incorporated by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

10 The present invention relates to the field of latches and more particularly to slam-
action latches in which a handle is lifted to release the latch pawl from engagement with a
keeper.

2. Brief Description of the Related Art

Slam-action latches are known in the art and are employed in a number of
15 applications for securing one or more panels together. Generally, latches coming within
this category operate by forcing a pawl into engagement with a keeper. For example,
where a first panel member has a pawl mounted on it and a second panel member, such as,
for example, a cabinet, has a keeper mounted thereon, slamming shut the first panel
member against the second panel member can secure the panels with the latch.

20 In many instances, separately provided spring members are utilized to bias the pawl
into engagement with a keeper member. Thus, when a panel to which the latch is installed
is closed, the pawl engages a keeper. The utilization of a separately provided spring
member often increases the cost of the latch and the time for assembly or construction of

the latch. In some cases, complex mechanisms are required to maintain spring members and align them with a pawl so the pawl can be regulated to operate and engage and disengage a keeper.

A need exists for a latch which can provide an improvement over the prior art in
5 that it will be less costly to produce and less time-consuming to assemble, as well as providing slam-action latching ability when the latch is detached from a keeper but in the closed position.

A further need exists for a latch which can be locked, and slammed shut to close and lock the latch, when its pawl is not engaged with a keeper.

10 In addition, load floor latches are commonly used in the automotive industry. Often, these latches are employed to secure the contents of a compartment in a cargo area. For example, load floor latches find use for securing a floor panel, such as the panel which regulates access to vehicle items, such as spare tires, tools, jacks, batteries, and the like. In many case, the floor panel is provided on the floor of a vehicle passenger or cargo
15 compartment. The latch therefore must be durable, and it is desirable that the latch withstand substantial force loads, such as those of the type generally encountered by bumps, rough terrain, and especially vehicular accidents, such as crashes, or rollover situations. It is important that compartment contents remain secured in the event of a vehicle crash or rollover. This is especially more important where the cargo compartment
20 is located in the same general area as the vehicle operator, or other passengers. For example, in station wagon type vehicles, the cargo space for passengers and items of cargo is the same. Thus, in this type of vehicle, there is great danger to be encountered should a rollover of the vehicle occur and the latch become unsecured. If this were to happen, the

compartment contents would spill out into the passenger compartment, thereby placing the vehicle operator in danger. A need exists for a load floor latch which has improved abilities to withstand a rollover, and facilitate latching of a panel, even under high stress conditions. It is also important that the latch, in addition to being durable, be easy to
5 construct and install.

SUMMARY OF THE INVENTION

The present invention provides a novel slam latch having a handle, a housing and a pawl member which is disposed to engage a keeper member to secure a first member, such
10 as a door or floor panel, to a second member, such as a frame or floor. Preferably, the latch can be installed on a closure panel and the keeper member on another panel or frame. The latch, for example, may be installed on a vehicle floor panel and a keeper can be installed on a corresponding frame.

The latch handle, upon being actuated, by lifting, operates to retract the pawl from
15 engagement with a keeper member. Preferably, an actuator is provided which extends through the housing and connects with the pawl. The handle, by contacting the actuator withdraws the pawl member out from engagement with the keeper to release the latch and permit the closure panel to be opened. The pawl member is preferably spring biased and is retracted inwardly, within the housing. The pawl member is slidably carried in the housing
20 and extends therefrom. The handle is pivotally connected to the housing and pivots relative thereto.

A locking mechanism preferably can be provided for securing the actuator against movement to prevent unauthorized actuation. The locking mechanism can be applied to

allow the latch to be locked to prevent the pawl from being released from a keeper member.

The latch further has an improved stabilizing mechanism which facilitates retention of the latch in a latching position during vehicle crashes and rollovers.

5 An object of the present invention is to provide a novel latch which can secure one or more members together, such as panels or the like, for selective release by actuating a handle of the latch.

Another object of the present invention is to accomplish the above objects by providing a spring-biased latch which can be closed by slam-action.

10 Another object of the present invention is to provide a novel latch which can be closed by slam-action, even when the latch handle is in the closed position, and when the latch is not connected to a keeper.

Another object of the present invention is to provide a latch which can be used in connection with panels of vehicles to regulate access to and from an area or compartment,
15 such as, for example, a floor panel and a floor storage compartment.

Another object of the present invention is to provide a novel latch having a pawl member which is slidably guided for movement within a housing.

Another object of the present invention is to provide a locking mechanism which can secure the latch against unauthorized opening.

20 Another object of the present invention is to provide resistance when the pawl member is being opened or closed with the handle to bias the pawl to an engaging position.

Another object of the present invention is to provide a latch which has improved retention characteristics under stress forces, such as those experienced by vehicle rollovers and crashes.

These and other objects of the invention will become apparent upon a reading of the following detailed description of the invention with reference to the drawings, and the appended claims.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

Fig. 1 is an exploded perspective view of a first embodiment of a latch according to the present invention.

Fig. 2 is a perspective, separate view of the pawl, actuator, locking element, lock plug and retainer of the latch of Fig. 1, shown in the locked condition.

Fig. 3 is a perspective, separate view of the pawl, actuator, locking element, lock plug and retainer of the latch of Fig. 1, shown with the lock plug and retainer in the locked condition, with the pawl in a partially returned position.

Fig. 4 is a perspective, separate view of a retaining member of the latch of Fig. 1.

Fig. 5, is a perspective, separate view of the handle of the latch of Fig. 1.

Fig. 6 is a left side, perspective view of the latch of Fig. 1, illustrated with the housing shown in sectional view.

Fig. 7 is a perspective, separate view of the pawl member of the latch of Fig. 1, as viewed from the bottom, front side thereof.

Fig. 8 is a perspective, separate view of the housing of the latch of Fig. 1, as viewed from the top, right front thereof.

Fig. 9 is a perspective, separate view of the actuator of the latch of Fig. 1.

Fig. 10 is a top plan, separate view of the housing of the latch shown in Fig. 1.

Fig. 11 is a top plan, separate view of the pawl member of the latch of Fig. 1.

Fig. 12 is a sectional view of the housing shown in Fig. 10, taken longitudinally
5 therethrough.

Fig. 13 is a front parallel perspective view of a second alternate embodiment of a
latch according to the present invention.

Fig. 14 is a rear parallel perspective view of the second alternate latch embodiment
shown in Fig. 13, viewed from the back with the handle in the open position.

10 Fig. 15 is a front parallel perspective view of the second alternate latch
embodiment shown in Fig. 14, viewed from the front right side with the handle in the open
position.

Fig. 16 is a front parallel perspective view of a third alternate embodiment of a
latch according to the present invention.

15 Fig. 17 is a sectional view of the third alternate embodiment of the latch shown in
Fig. 16.

Fig. 18 is a rear parallel perspective view of the third alternate embodiment of the
latch of Figs. 16 and 17, shown with the handle lifted and in the open condition.

20 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference being made to Fig. 1, where a first alternate embodiment of a latch 10
according to the present invention is shown comprising a latch body or housing 11, a

handle 12, a pawl member 13, and an actuator 14. Biasing means for biasing the pawl member 13 toward a latching position is shown comprising a spring 15.

The housing 11 has an upper flange 25 which defines the perimeter of the latch 10. Mounting means is provided on the housing 11, and preferably, for example, can comprise
5 posts, such as those 26, which, for example, can have a bore with threads for receiving a matingly threaded bolt (not shown) for attachment of the latch 10 to a panel member (not shown). It will be understood that any suitable mounting members, such as, rivets, screws, pins, barbs and the like can be used to secure the housing 11 to a panel.

Preferably, the latch 10 can be installed on a floor panel of a vehicle to regulate access to
10 and from a compartment.

Locking means is also provided to lock the latch 10 against unauthorized opening. The locking means is shown comprising a lock plug 20 which has a key slot 28 therein. Preferably, the housing 11 has a socket 19 in which the lock plug 20 is installed. The locking means further includes a locking element 21, and retaining means for retaining the
15 lock plug 20 on the housing 11. The retaining means is shown comprising a retaining member 22 which is disposed on a connecting end 27 of the lockplug 20 located on the lockplug end opposite of the key slot 28 end. Preferably, the retaining member 22 comprises a spring member and is flexible.

The retaining element 22 secures the lock plug 20 and further is provided to
20 selectively engage the locking element 21, as shown best in Figs. 2 and 3, to lock the actuator 14 from movement and thereby maintain the pawl member 13 in a latched position. Referring to Fig. 4, the retaining member 22 has an arm 24 which extends outwardly therefrom for engagement with the locking element 21 (Figs. 2 and 3). Figs. 2

and 3 show the retaining member 22 installed on the lock plug-connecting end 27. As shown in Fig. 4, the retaining member 22 has an assembly slot 30 for facilitating snap-fit installation onto the lock plug 20. Detents 31, 32 are provided on the retaining member 22 for indicating the stop positions of the retaining member 22 when the lock plug is rotated with a key (not shown). The retaining member 22 is configured to be rotated by the lock plug 20 with the operation of a key (not shown) inserted and rotated in the key slot 28.

Referring to Fig. 5, the handle 12 is shown in a separate view having a body 37 with a lifting portion 40, a pair of flanges 38, 39 on opposite sides of the handle 12, and mounting means for mounting the handle 12 to the housing 11, the mounting means comprising a pair of pivot bosses 41, 42 disposed on the flanges 38, 39, respectively. Contact means for contacting the actuator 14 is provided on the front of the handle 12 opposite the lifting portion 40. The contact means is shown comprising a tab 43 disposed on the handle body 37. The handle 12 further has a recess 49 provided for accommodating the lock plug 20, by permitting the top of the lock plug 20 to reside in the recess 49 when the handle 12 is closed.

Reference now being made to Fig. 6, the tab 43 is provided to engage with the front of the actuator 14, when the handle 12 is pivoted by lifting. This lifting of the handle 12 draws the actuator 14 rearwardly within the housing 11 and through its engagement with the pawl 13, the actuator 14 retracts the pawl member 13 inwardly toward the housing 11. As shown in Fig. 1, a slot 50 is disposed in the front wall 49 of the housing 11 for receiving the pawl member 13 therein. The slot 50, preferably, is matingly

configured to accommodate the pawl 13 and facilitate the movement of the pawl member 13 therein.

The housing slot 50 preferably can be provided with strengthening ribs 51, 52 disposed on opposite sides of the slot 50. The slot 50 is shown having a pair of tracks 54, 55, which are provided for mating association with the pawl 13. The pawl member 14, as shown in Fig. 7, has surfaces 57, 58 which facilitate siding of the pawl 14 along the tracks 54, 55 of the housing slot 50.

As shown in Fig. 1, the housing 11 has a pair of apertures 60, 61 each being disposed on opposite sides thereof. The pivot bosses 41, 42 of the handle 12 are carried in the pivot apertures 60, 61, respectively to pivotally maintain the handle 12 on the housing 11. Referring to Figs. 1 and 5, the handle 12 has side flanges 38, 39 which facilitate alignment of the handle 12 relative to the housing 11. The housing 11 is provided with a first side ledge 64 and a second side ledge 65 disposed on each side thereof. The first side ledge 64 provides a seat for the handle side flange 38 when the handle 12 is in its closed (Fig. 1) position. Similarly, the second side ledge 65 provides a seat for the second flange 39 on the opposite handle side. Preferably, the first and second ledges 64, 65 are positioned at a height sufficient to raise the handle 12 slightly off of the top of the lock plug 20. Alternately, the lock plug 20 can be utilized to further stabilize the latch handle 12 by providing an additional seat on which the handle 12 may rest. This is accomplished by arranging the flanges and heights of the first and second side ledges to correspond to the height of the lock plug 20.

Referring to Fig. 9, the actuator 14 is shown having handle engaging means for engaging with the handle 12. The handle engaging means is shown comprising a plurality

of contact ribs 70 which are angled to maximize the contact with the handle tab portion 43 when the handle 12 is pivoted to engage the actuator 14. The contact ribs 70 are shown supported on a shelf or base 69 of the actuator. The actuator 14 further has connecting means for connecting with the pawl member 13 to retract and release the pawl 13. The
5 connecting means is shown comprising snap legs 71, 72 which extend downwardly from the actuator shelf or base 69 and are provided with a tapered flange portions 73, 74, respectively, which are shown provided on three sides of each leg 71, 72. Stop means is provided for stopping the locking element 21. The stop means is shown comprising a stop leg member 75 extending downwardly from the shelf or base 69 of the actuator 14.

10 Preferably, the stop leg 75 is provided on the outer end of the actuator 14 to facilitate interaction with the locking element 21. Referring to Fig. 1, the actuator stop leg 75 is provided with a widened portion, such as the head 76, disposed facing and in a position for engaging the locking element 21. The actuator 14 further comprises supporting means for supporting the actuator 14 in relation to the pawl 13 and housing 11. The supporting
15 means are best shown in Fig. 9 comprising supporting legs 77, 78 extending downwardly from the shelf or base 69 of the actuator 14.

Fig. 10 shows the housing 11 with a floor 80 having a plurality of slots 81, 82, 83, 84, 85 disposed therein. The slots 81, 82, 83, 84, 85 are provided to correspond, respectively, with the snap legs 71, 72, stop leg 75, and supporting legs 77, 78 to permit
20 them to pass through the housing floor 80 and into the pawl 13.

The pawl 13 is shown having a plurality of slots 91, 92, 93, 94, 95 disposed therein for accommodating the legs 71, 72, 75, 77, 78 of the actuation member 14 which extend into the slots 91, 92, 93, 94, 95, respectively. Referring to Figs. 1 and 8, the housing 11 is

shown having a pawl slot 50 which is matingly configured to slidably carry the pawl 14 therein. The mating configuration of the slot 50 facilitates alignment of the slots 91, 92, 93, 94, 95 with the housing slots 81, 82, 83, 84, 85, respectively, to enable the legs of the actuator 14 to extend through the pawl slots. The outer slot 85 of the pawl member 13 is
5 partially open on a side thereof. The stop leg 75 of the actuator extends through the outer slot 85. As shown best in Figs. 2 and 3, the locking element 21 is positioned in the outer slot 85 for selective engagement with the retaining member arm 24. The locking element 21 is maintained within the pawl slot 50 of the housing 11. As shown in Fig. 6, the pawl slot 50 is defined by the housing floor 80, which defines the top of the slot 50, a rear wall
10 101, and a bottom wall 102. The pawl 14, spring 15, and locking element 21 are held between the floor 80 and the bottom wall 102.

The pawl 13 is biased with the force of the spring 15 into a forward, engaging position, where the pawl 14 protrudes outwardly from the housing 11. After the pawl 14 has been retracted, the bias from the spring 15 further operates against the pawl 14 to
15 return the pawl to its forward, latching position. The pawl 14 is withdrawn by lifting the handle 12, which forces the handle tab 43 into engagement with the contacting ribs 70 of the actuator 14. The actuator 14 is then forced rearwardly in the housing 11, with the legs 71, 72, 77 and 78 engaging against the rearward end of each respective pawl slot 91, 92, 94, 95, and the rearward end of the stop leg 75 engaging against the locking element 21.
20 The configuration of the present latch 10 allows the pawl 14 to be forced inward into the slot 50 of the housing 11 when encountering a force, such as that from a keeper (not shown). This permits the latch 10 to be slam locked, even when the retaining member 22 is in the locked position. The pawl 14 can be depressed inwardly and the locking member

21 will be accommodated by the outer slot 85 of the pawl 14, when the pawl is forced inward. Of course, the pawl 14, after being forced inward, once it clears a keeper and encounters no further resistance, is biased by the spring 15 toward its outward position, to secure the latch 10.

5 As shown in Figs. 1 and 12, detent means for holding the handle 12 in the raised position is shown comprising a resilient engaging element 98, 99 disposed on opposite sides of the housing 11. The detent means preferably can maintain the handle 12 in a raised position until the detent force is overcome by lowering the handle 12.

Referring to Fig. 13, a second alternate embodiment of a latch 210 according to
10 the present invention is shown. The latch 210 is similar to the latch 10 of the first embodiment shown and described herein, but having an alternate locking mechanism and an alternate pawl 213, which is configured having a rectangular cross-section to slide within a space 250 provided in the housing 211. The alternate locking mechanism shows locking means comprising a lock plug 222 with a locking pawl arm 224. The locking pawl
15 arm 224 is preferably a spring member to permit slam-action closing of the latch 210 in both conditions, when the locking pawl arm 224 is in the latching (Fig. 12) position, and when the locking pawl 224 is rotated to the side, as shown in Fig. 13, in the open position. The spring force furnished with the locking pawl arm 224 enables the locking pawl arm 224 to snap over a keeper (not shown), and into its locking position.

20 As shown in Fig. 14, the handle 212 is lifted and the handle tab 243 engages the actuator 214 to retract the pawl 213 inwardly within the housing slot 250 (Fig. 15).

Reference now being made to Figs. 16-18 where a third alternate embodiment of a latch 310 is shown according to the present invention. The latch 310 is provided to

operate similar to the latch of the second embodiment 210 described above, but without a lock. The latch 310 is shown having a housing 311, a handle 312 pivotally connected thereto, a pawl 313 disposed to slide in a slot 350 of the housing 311, an actuator 314, and a spring 315 which biases the pawl 313 toward a latching position, to protrude
5 outwardly from the housing 311. The actuator 314 can connect with the pawl 313 through a plurality of slots, such as that 370, shown in Fig. 17, which are provided on the housing floor 380. The handle tab 343 is provided to engage the actuator 314 when the handle 312 is lifted, as shown in Fig. 18. Other features, while not shown, such as the detent means described above in connection with the latch 10, can also be employed with
10 the latch 310. The actuator 314 can comprise the same configuration with the same legs as those described above in connection with the actuator 14 of the first embodiment of the latch 10.

As shown in Fig. 16 mounting means is provided on the housing 311, comprising bores, such as that 326 (there being one or more additional bores, not shown).

15 One or more of the features described herein in connection with a latch embodiment disclosed herein, can be employed with another latch embodiment consistent with the principles of the applicant's present invention. Other modifications to the above description can be made consistent with the spirit and scope of the invention disclosed herein. For example, while the keeper is referred to as a separate member, it will be
20 understood that the keeper can comprise a panel, enclosure frame or other surface which the pawl can engage, consistent with the disclosure provided herein. Also, while the present invention is described in connection with a lockplug, it is also understood that a knob, handle or other member can be used to rotate a member into and out of the way of

the actuator or secondary keeper (such as with the second alternate embodiment) to regulate the opening and closing.

These and other advantages of the present invention can be made consistent with the spirit and scope of the invention as disclosed in the Summary of the Invention, the

5 Brief Description of the Drawing Figures, the Detailed Description of the Preferred Embodiments and the appended claims. While the above description constitutes the preferred embodiment of the present invention, it will be appreciated that the invention is subject to modification, variation and change, without departing from the proper scope or fair meaning of the present invention. In this regard, while the various features of the

10 present invention have been shown and described in relation to a vehicle floor panel, it will be understood that many of these features are suitable in connection with latching of other members.

What is claimed is:

1. A pawl latch for securing a first member to a second member wherein a pawl of the latch is provided to engage a keeper, said latch comprising:
 - a) a housing which is adapted for mounting to one of said first member and
5 said second member;
 - b) a pawl member connected to said housing and adapted to engage a keeper to secure the latch in a closed position, wherein said pawl member comprises a living spring member;
 - c) a handle pivotally connected to said housing and being movable over a
10 pivot range, said handle including actuating means for selectively engaging the pawl member when the handle is pivoted.
2. The latch of claim 1, wherein said pawl member has a foot which is disposed for engagement with said handle actuating means when said handle is pivoted.
3. The latch of claim 2, wherein said pawl member foot is provided with at least one
15 slot therein, and wherein said actuation means comprises at least one finger, wherein said finger is moved into said slot upon pivotally moving the handle to retract said pawl by moving said pawl with said handle.
4. The latch of claim 2, further comprising locking means for locking said latch handle against movement relative to said housing.
- 20 5. The latch of claim 4, wherein said locking means comprises locking legs disposed on said handle and a locking member which has notches therein which correspond to said locking legs, said locking member being selectively rotatable between a first position wherein said notches are aligned with said locking legs to permit the handle to be movable

relative to said housing and a second position, wherein said notches are not aligned with said locking legs to prevent movement of said handle relative to said housing.

6. The latch of claim 5, wherein said handle has a top surface with an aperture therein and wherein said locking legs comprise generally L-shaped members disposed on opposite
5 sides of said aperture.

7. The latch of claim 1, wherein said housing comprises a seat on each side thereof for supporting said handle.

8. The latch of claim 7, wherein said handle has a top surface and a flange disposed on each side of said top surface extending downwardly therefrom, wherein each said
10 flange engages said housing seat to position said handle relative to said housing.

9. The latch of claim 1, wherein said housing has stop means for holding the handle in a partially raised position.

10. The latch of claim 1, wherein said housing has stop means for securing the handle in a position relative to said housing.

15 11. The latch of claim 10, wherein said stop means comprises at least one leg member connected to the housing at one end thereof and having a free end with an engaging element thereon, and wherein said handle has at least one limiting element which is disposed on said handle to engage said engaging element of said at least one leg member when said handle is moved to its closed position.

20 12. The latch of claim 9, wherein said stop means comprises at least one leg member connected to the housing at one end thereof and having a free end with an engaging element thereon, and wherein said handle has at least one limiting element which is

disposed on said handle to engage said engaging element of said at least one leg member when said handle is pivoted.

13.. The latch of claim 12, wherein said at least one limiting element comprises a tab portion extending downwardly from said handle surface.

5 14. The latch of claim 12, wherein said at least one leg member is a flexible member.

15. The latch of claim 12, wherein said at least one leg member comprises a spring member.

16. The latch of claim 4 wherein said locking means comprises a lockplug and a retaining member which connects said lockplug to said housing.

10 17. The latch of claim 1, wherein said housing has protruding flanges disposed vertically on each side of said pawl.

18. A pawl latch for securing a first member to a second member, wherein the latch engages with a keeper, said latch comprising:

- a) a housing, including a pawl member connected thereto and being movable
15 in relation to said housing;
- b) a handle pivotally connected to said housing and being pivotally movable over a pivot range, said handle including actuating means for engaging the pawl member;
- c) wherein said pawl member comprises a living spring member and includes a leg portion which is disposed for engagement with said handle actuating means upon
20 rotation of said handle;
- d) wherein said pawl member is joined with said housing along an edge of the pawl member.

19. The latch of claim 18, wherein said pawl member leg portion is provided with at least one slot, and wherein said actuation means comprises at least one finger, wherein said finger is moved into said slot upon pivotally moving the handle to retract said pawl.

20. The latch of claim 18, further comprising locking means; wherein said handle has a top surface with an aperture therein; wherein said locking means includes locking legs disposed on said handle on opposite sides of said aperture, and a locking member which has notches therein which correspond to said locking legs, said locking member being selectively rotatable between a first position wherein said notches are aligned with said locking legs to permit the handle to be movable relative to said housing and a second position, wherein said notches are not aligned with said locking legs to prevent movement of said handle relative to said housing.

21. The latch of claim 1, further comprising latching facilitating means for increasing the engaging force between said pawl member and a keeper.

22. The latch of claim 21, wherein said pivot range includes at least one position over said range wherein said handle is closed, and wherein said latching facilitating means comprises a plurality of projecting elements provided on said handle to engage said pawl member and direct said pawl member toward said keeper when said handle is closed.

23. The latch of claim 1, wherein said housing has a pair of spaced apart flanges defining a space therebetween, and wherein said pawl member is disposed between said spaced apart flanges, said pawl member being pivotally movable when engaged with said handle, said pawl member having resistive means for imparting resistance to the pawl member relative to the housing when the pawl member is pivotally moved.

24. The latch of claim 23, wherein said resistive means comprises a boss disposed on each opposite lateral side of said pawl member for engagement with an adjacent housing flange.

25. The latch of claim 1, further comprising locking means for locking said handle
5 against movement relative to said housing, wherein said housing further comprises a sleeve, and wherein said locking means comprises a lockplug carried in said sleeve.

26. The latch of claim 1, further comprising locking means for locking said handle
10 against movement relative to said housing, wherein said locking means comprises a lockplug carried on said housing and mounted thereto with retaining means, wherein said handle has handle keeper means disposed on said handle, and wherein said lockplug has engaging means for selective positioning relative to said handle keeper means to secure and release said handle relative to said housing.

27. A pawl latch for securing a first member to a second member wherein a pawl of the latch is provided to engage a keeper, said latch comprising:

15 a) a housing which is adapted for mounting to one of said first member and said second member;

b) a pawl member connected to said housing and adapted to engage a keeper
20 to secure the latch in a closed position, wherein said pawl member comprises a living spring and has a leg extending from the housing at a top end thereof and an engaging element at the bottom leg end thereof, said top leg end being connected to said housing along an edge thereof to form a pivot axis about which said pawl member pivots, and wherein said living spring biases said pawl member engaging element away from said housing;

c) a handle pivotally connected to said housing and being movable over a pivot range, said handle including actuating means for selectively engaging the pawl member when the handle is pivoted.

28. The pawl latch of claim 1, wherein said pawl member has slots disposed therein,
5 and wherein said actuating means comprises fingers which are disposed for insertion into said slots to facilitate pivoting of said pawl member with said handle when said handle is pivoted.

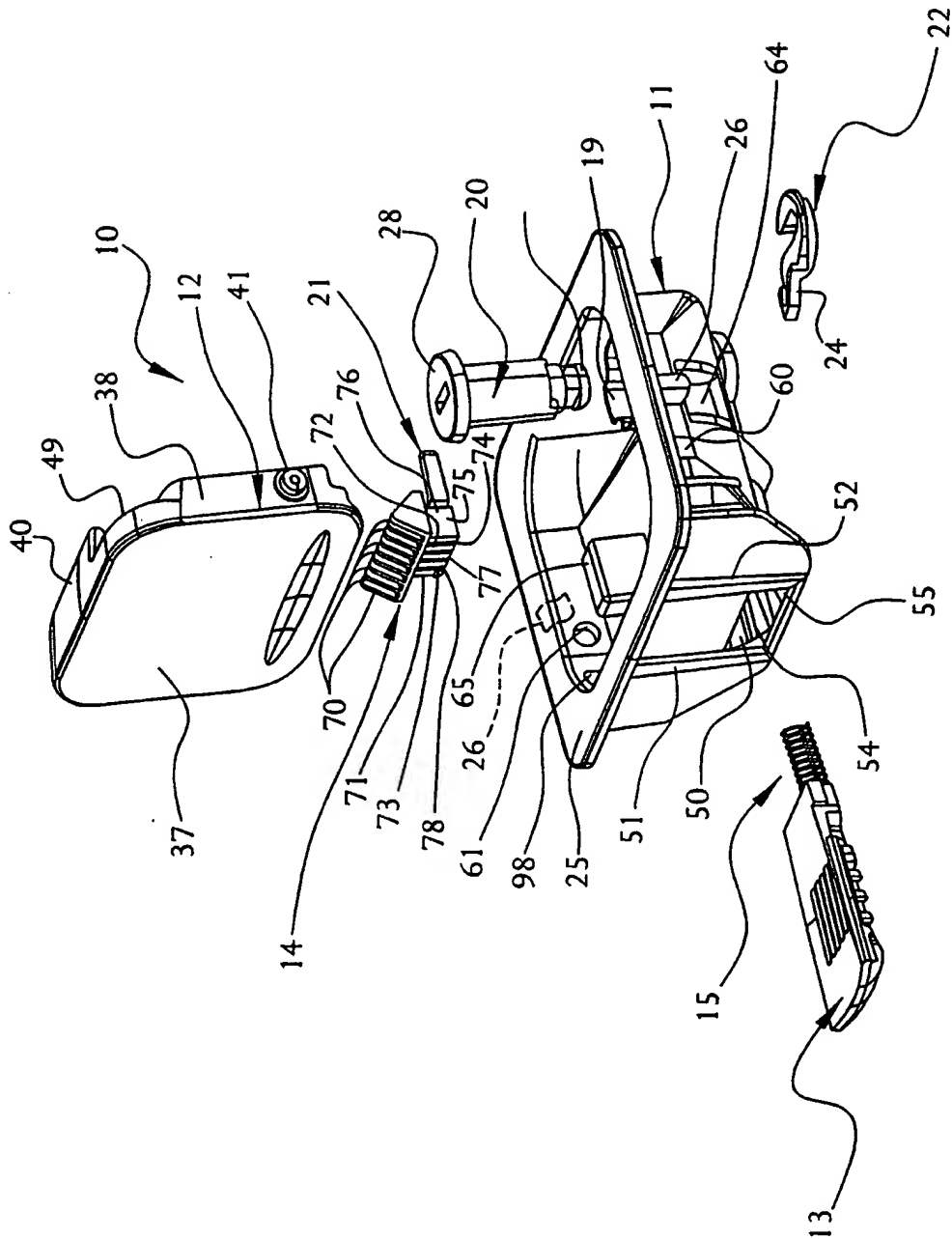


FIG. 1

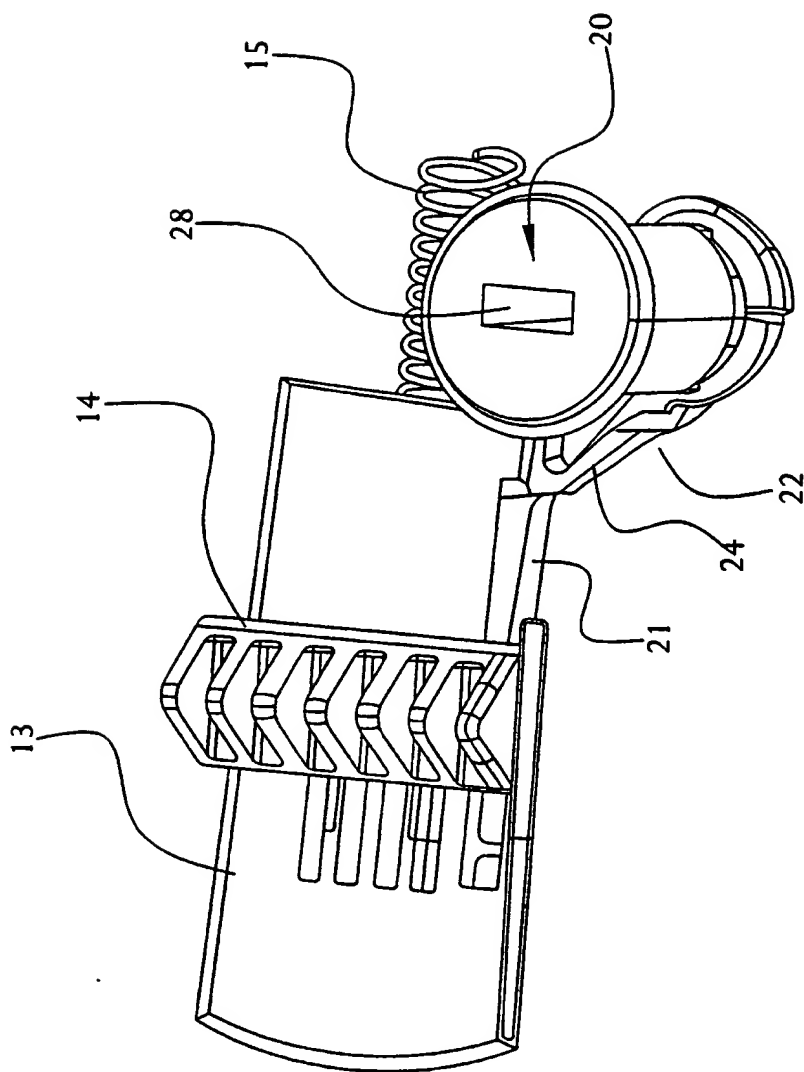


FIG. 2

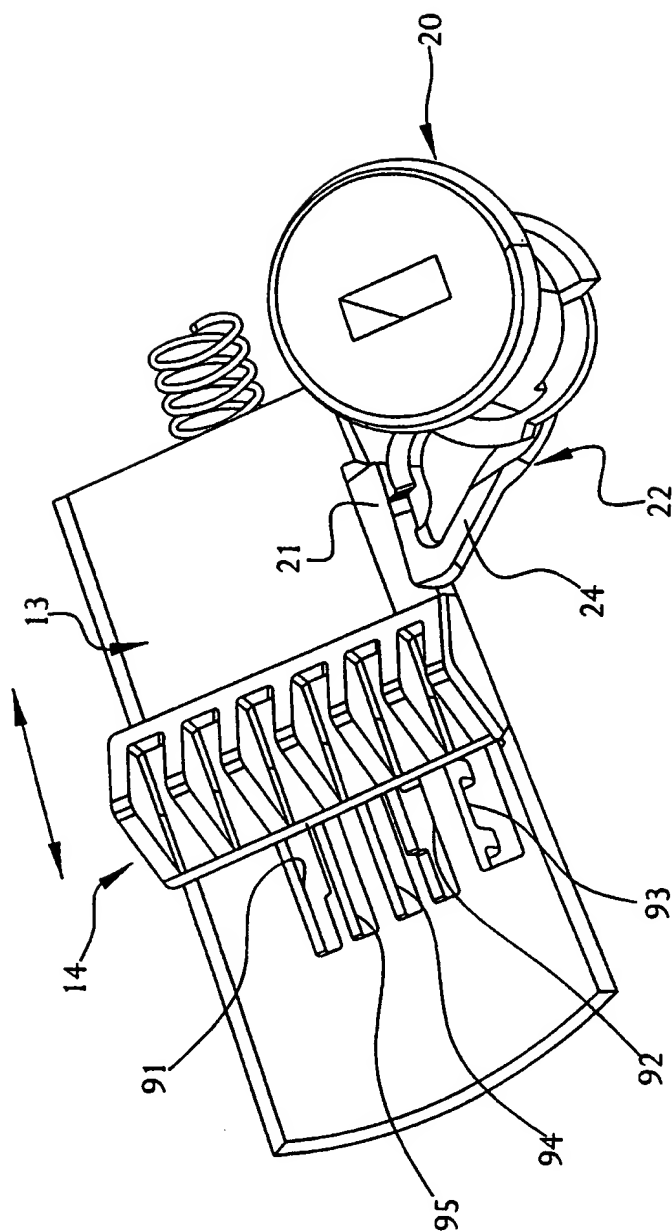


FIG. 3

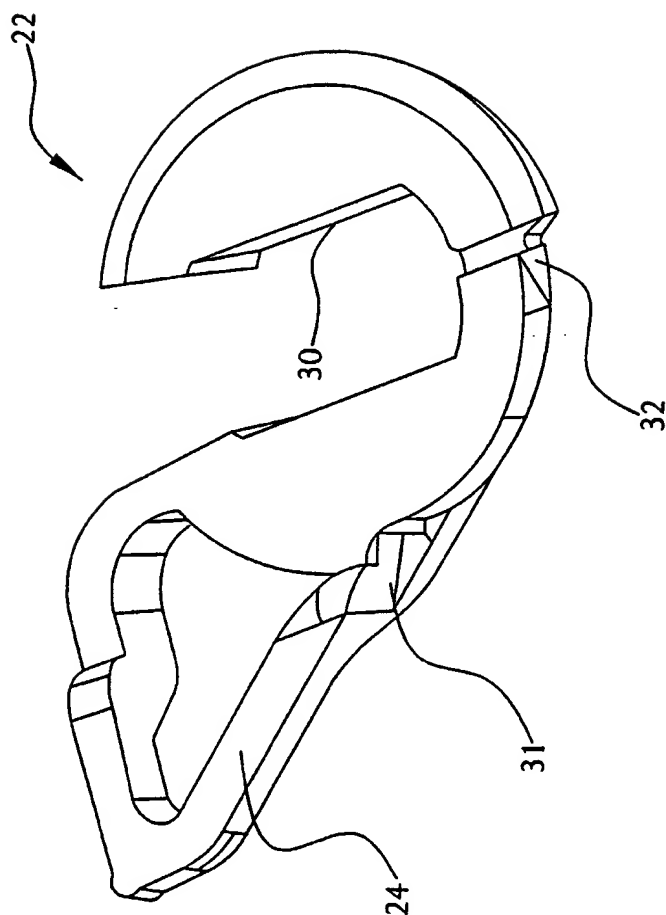


FIG. 4

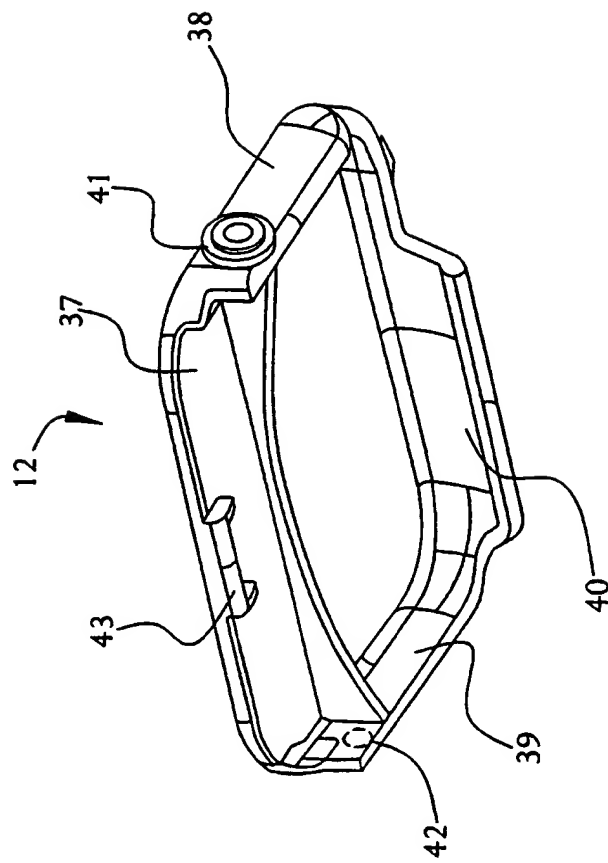


FIG. 5

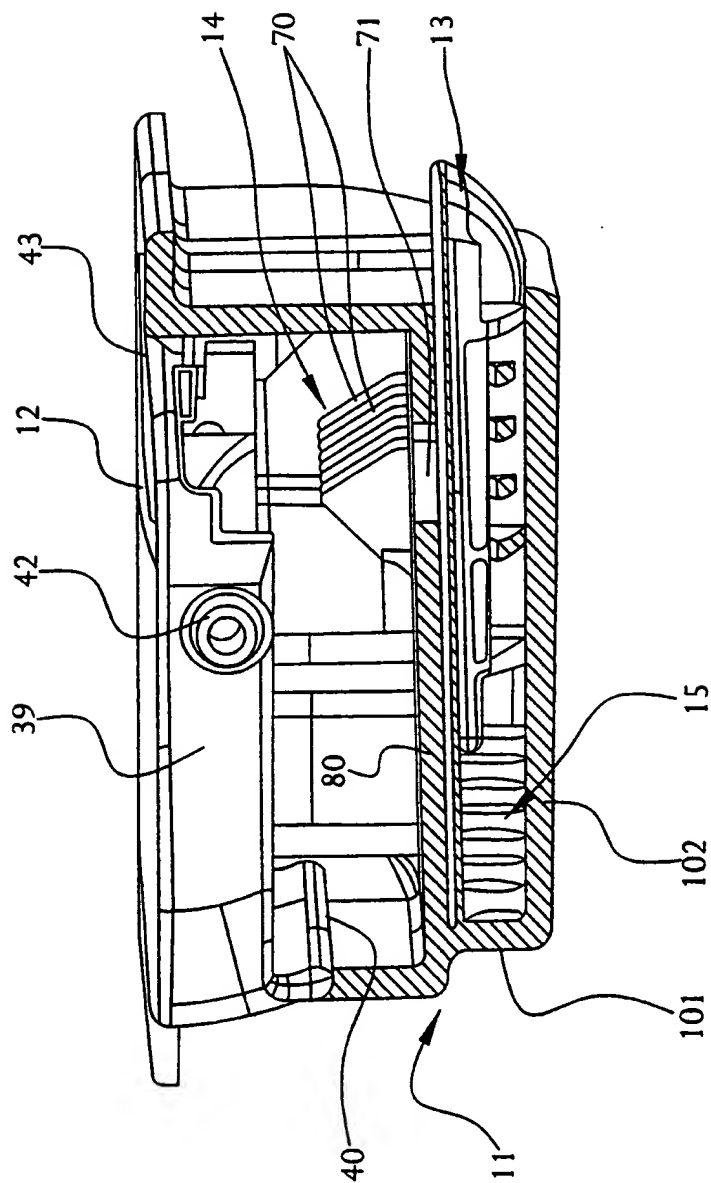


FIG. 6

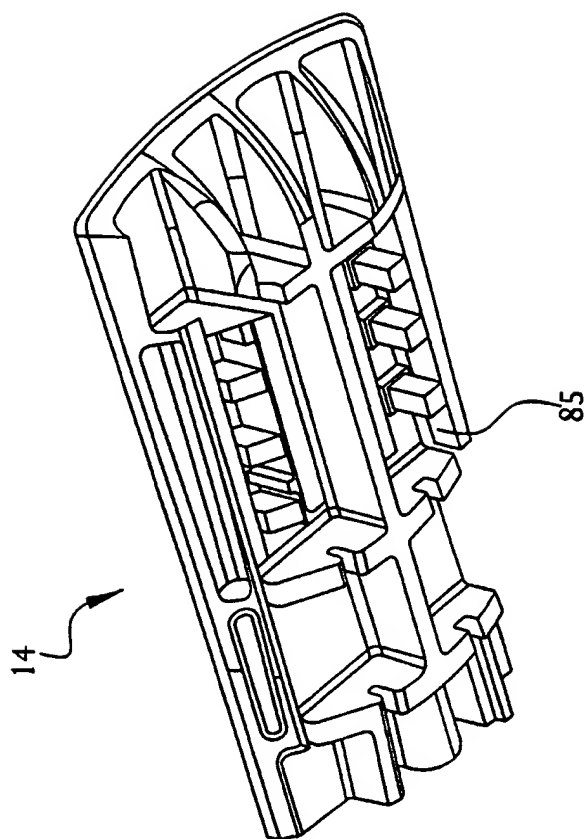
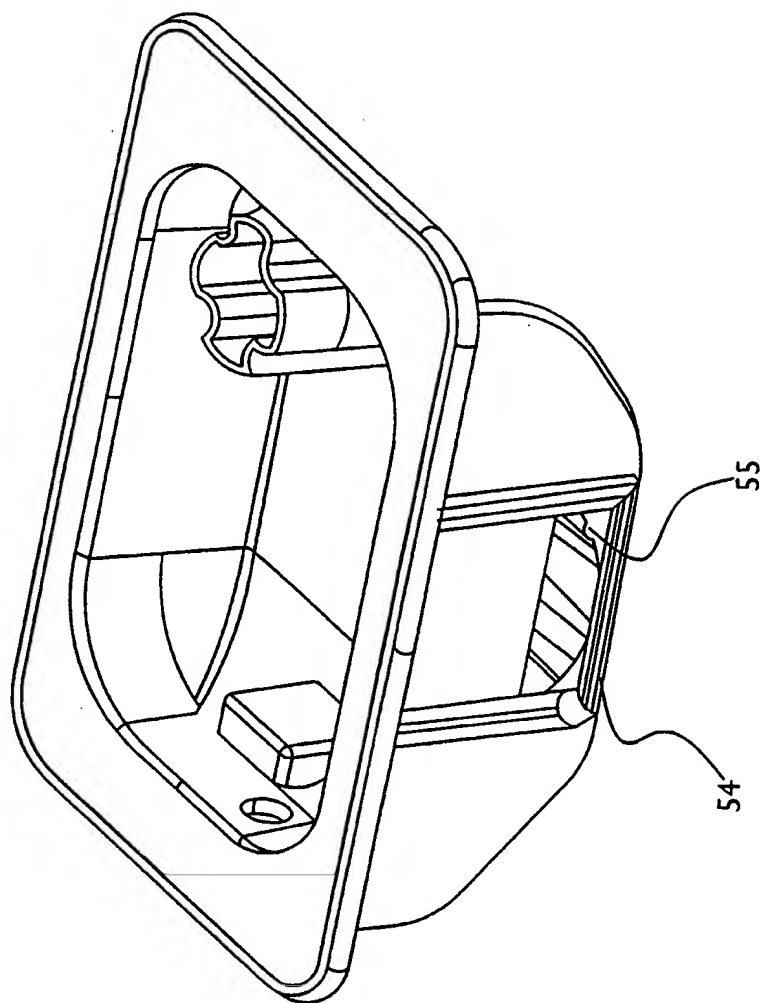


FIG. 7



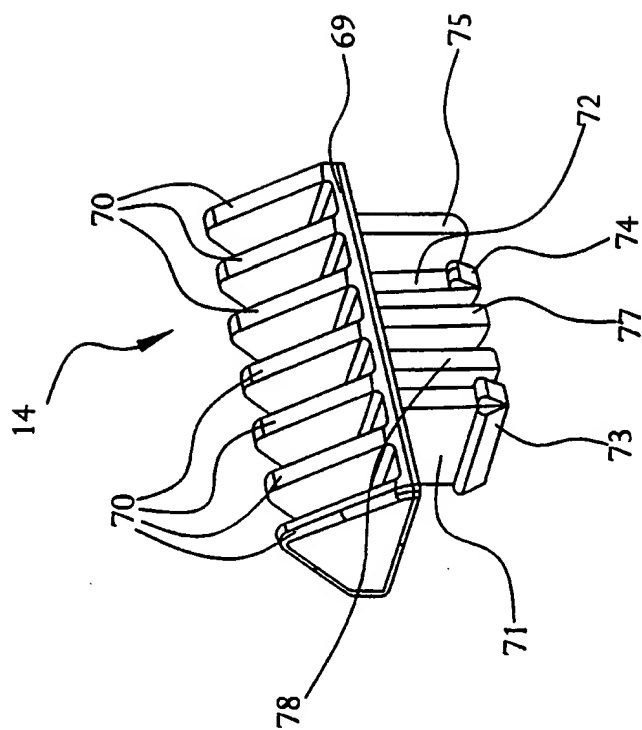


FIG. 9

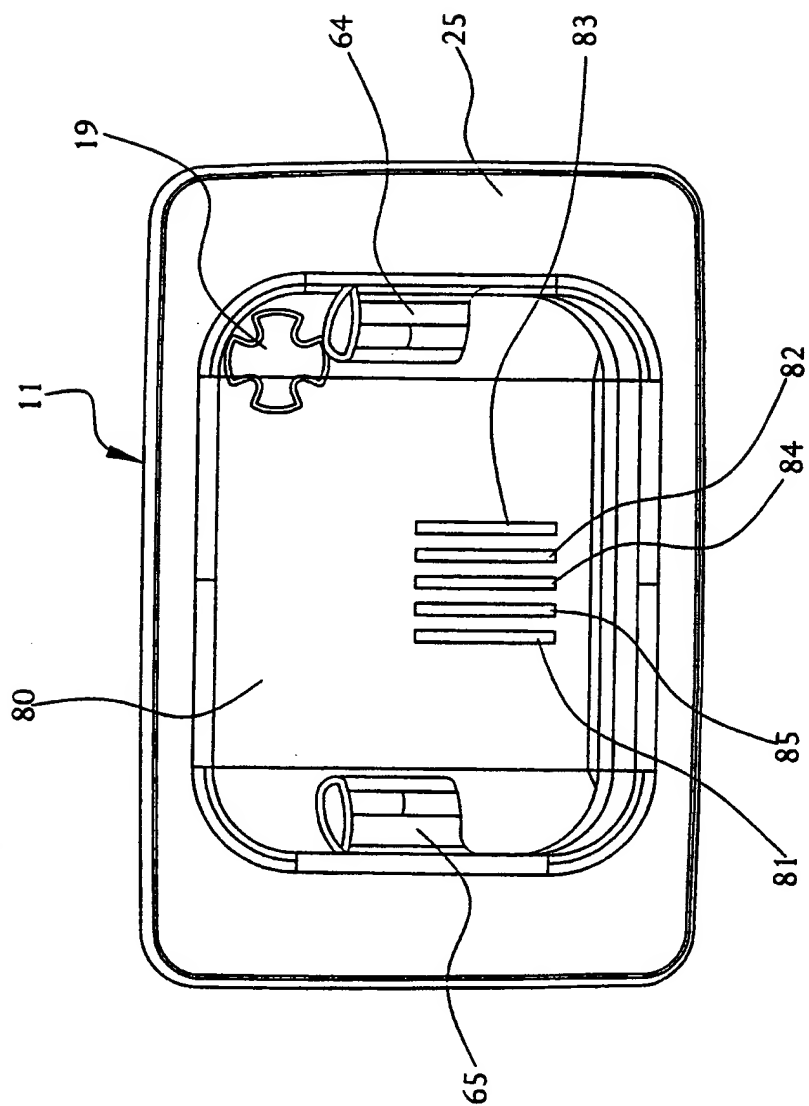


FIG. 10

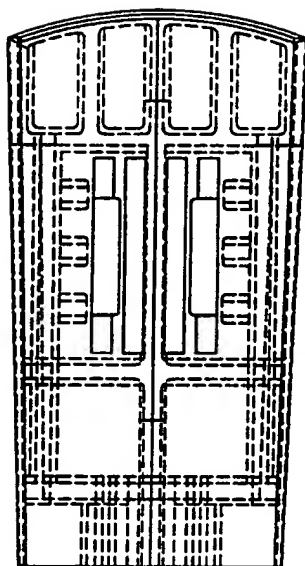


FIG. 11

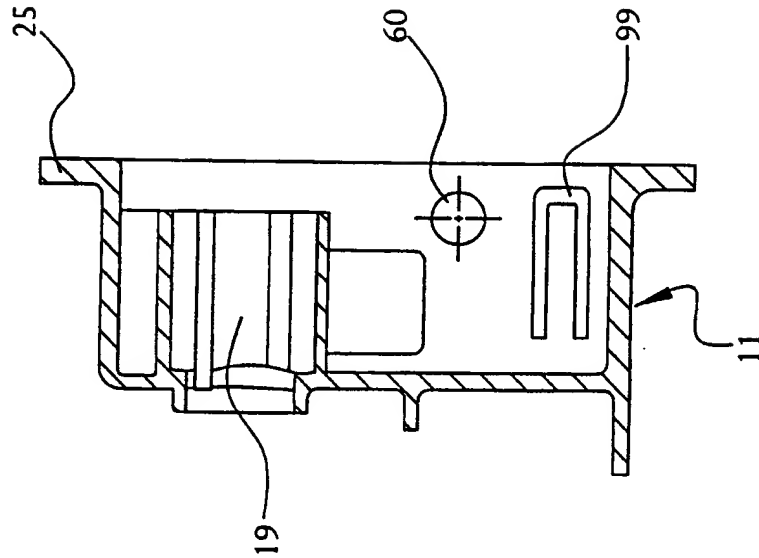


FIG. 12

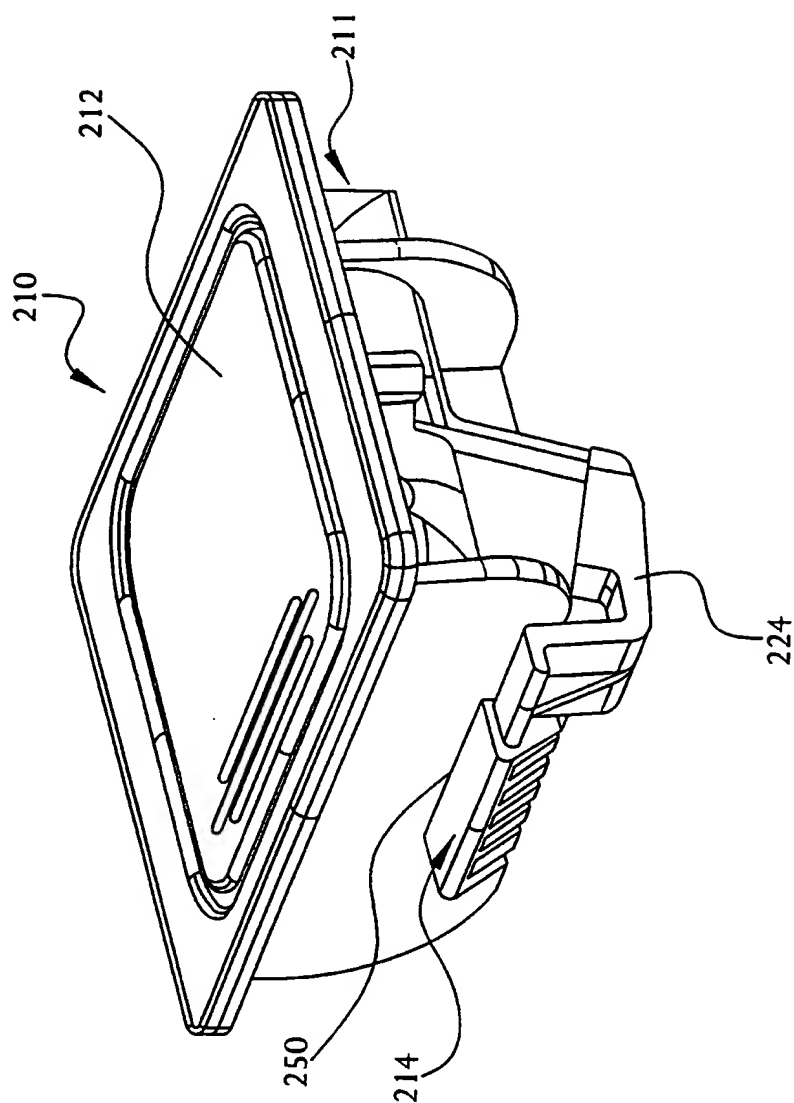


FIG. 13

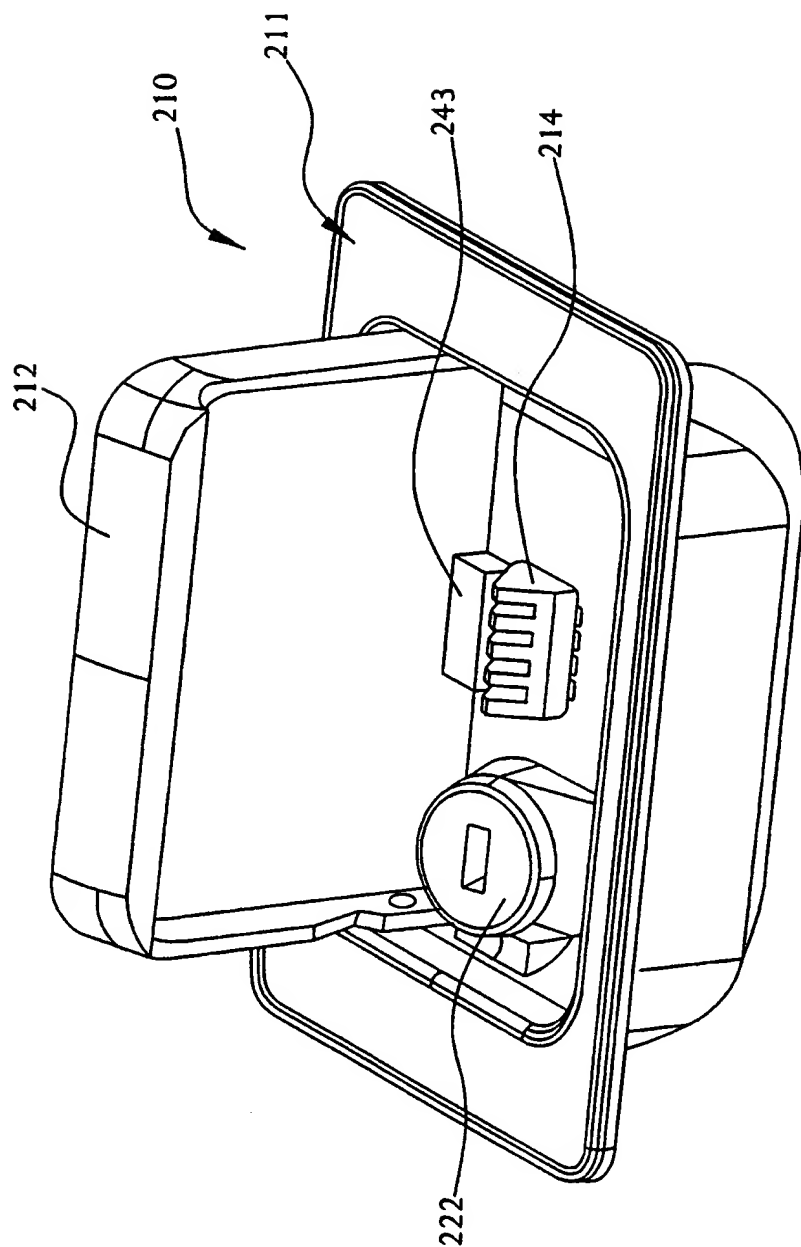


FIG. 14

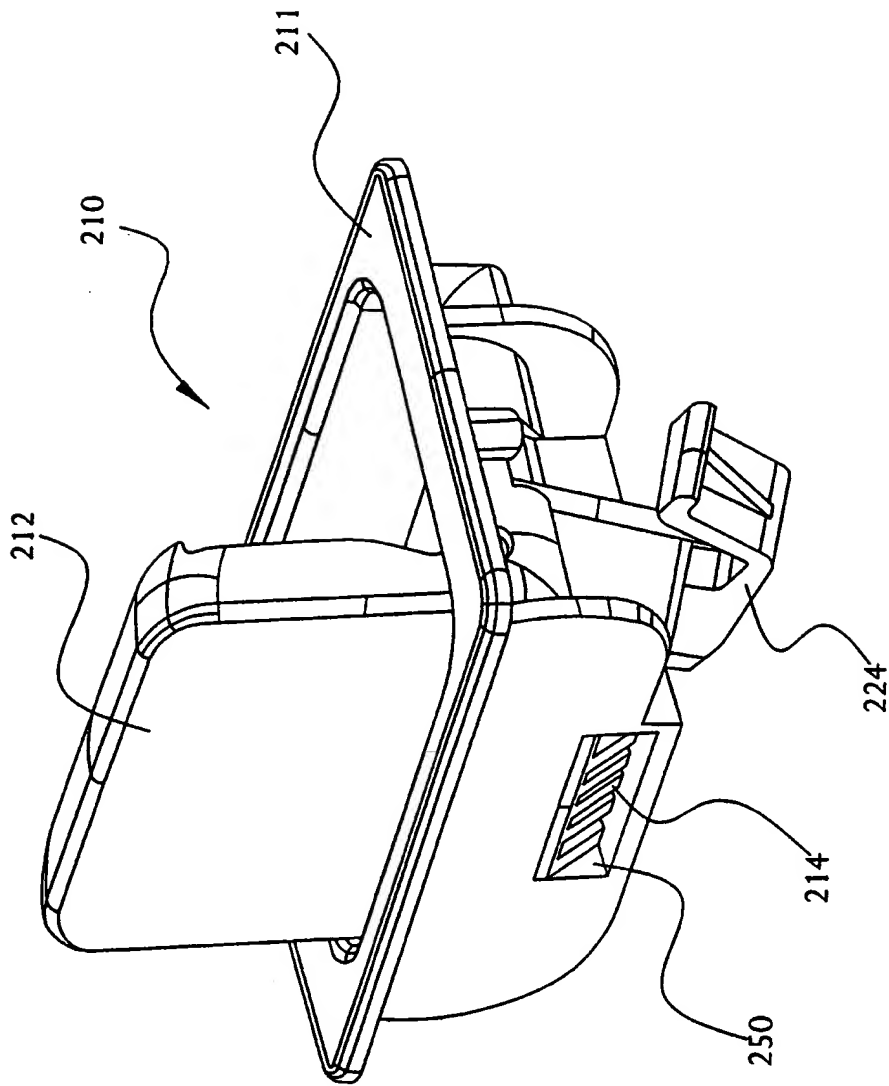


FIG. 15

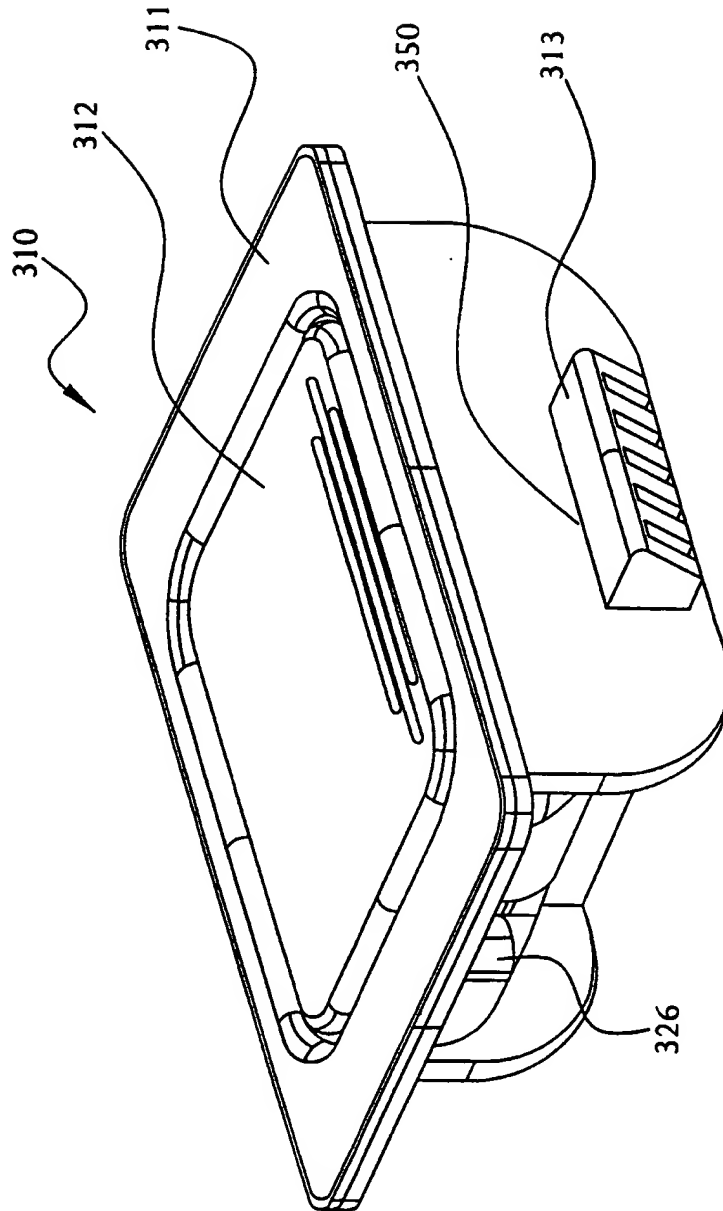
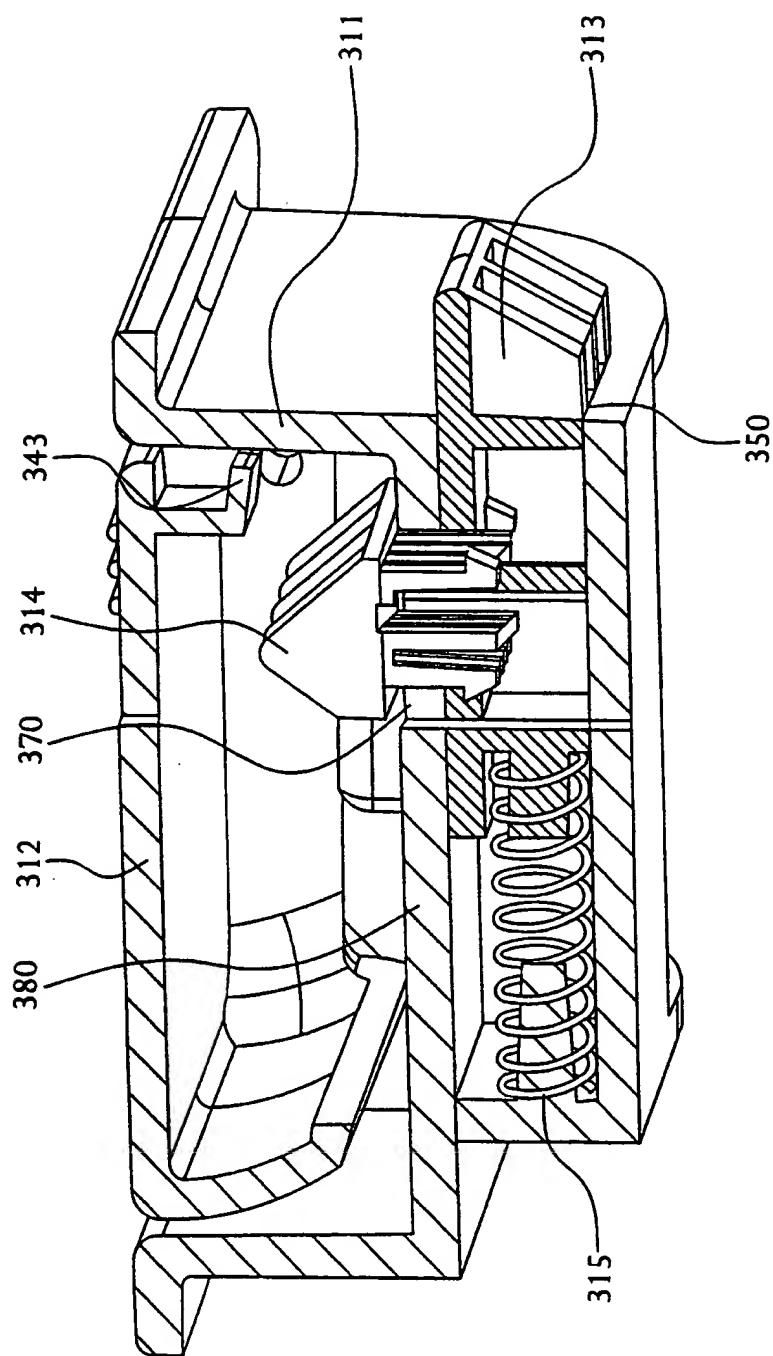


FIG. 16



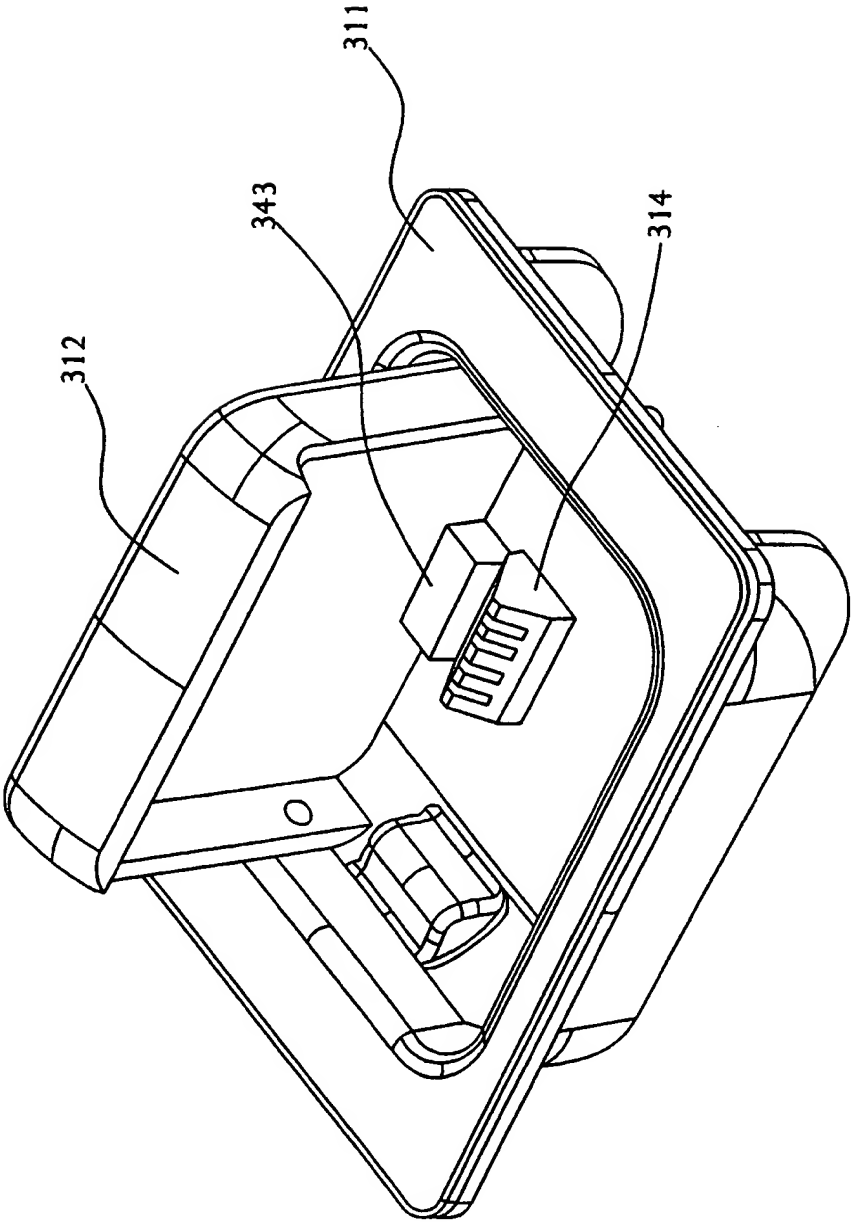


FIG. 18

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US00/04540

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B60R 25/02; B62H 5/04; E05B 13/10; F16C 3/00; G05G 5/00

US CL : 70/208

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 70/208; 292/226, 228, 200, 202, 203, 126, 100, 173, 153, 150, Dig38, Dig31, Dig63.

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|----------------------------|
| X | US 3,782,141 A (DOERRFELD) 01 January 1974 (01.01.1974), see entire document. | 1-4, 7, 16-19, 25-27 |
| X | US 2,987,908 A (PELCIN) 13 June 1961 (13.06.1961), see entire document. | 1-4, 7-14, 16-19, 25-27 |
| A | US 5,297,404 A (EMBRY) 29 March 1994 (29.03.1994), see entire document. | 24 |
| A, P | US 5,878,608 A (ALYANAKIAN) 09 March 1999 (09.03.1999), see entire document. | 4, 16, 25 |
| A | US 4,969,916 A (WEINERMAN et al) 13 November 1990, see entire document. | 1, 2, 4, 10, 16-18, 23, 25 |



Further documents are listed in the continuation of Box C.



See patent family annex.

| | |
|---|--|
| * Special categories of cited documents: | |
| "A" document defining the general state of the art which is not considered to be of particular relevance | "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention |
| "E" earlier application or patent published on or after the international filing date | "X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone |
| "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | "Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art |
| "O" document referring to an oral disclosure, use, exhibition or other means | "&" document member of the same patent family |
| "P" document published prior to the international filing date but later than the priority date claimed | |

Date of the actual completion of the international search

Date of mailing of the international search report

Name and mailing address of the ISA/US

Commissioner of Patents and Trademarks

Box PCT

Washington, D.C. 20231

Facsimile No. (703)305-3230

Authorized officer

Lynne Browne

Telephone No. 703-308-2168

02 AUG 2000